

E. 1x.

18/

29,976/B



Digitized by the Internet Archive
in 2019 with funding from
Wellcome Library

<https://archive.org/details/b30516626>

21 G. A N 359.20
INQUIRY

INTO THE

Original Production

OF

INSECTS

IN

HUMAN BODIES,

Especially of the

Seminal Animalcula;

And whether these pass the Testicular Strainers, and are repositied in the Seminal Bladders in Infants, or not till near Puberty.

L O N D O N:

Printed for J. ROBERTS in *Warwick-Lane.* 1727. (Price 6 d.)



(3)

A N
I N Q U I R Y
I N T O T H E
Original Production
O F
I N S E C T S
I N
Human Bodies.

NOT only have the manner of Secretion and Use of the Genital Liquor been the occasion of Disputation, but also its Matter and Composition have been the Subject of much Inquiry ; and the Methods they have used for Satisfaction, were, (1st) Hypothetic Arguments. (2^{ly})
A 2 Expe-

Experimental Examination. Of the first sort, *viz.* Inquirers, or rather Gueffers, are, (1.) Such as derive the Sperm from the Brain only. (2.) From Brain, Heart, and Liver. (3.) From an uncertain Juice convey'd from the Brain along the spinal Marrow to the Spermaticks. (4.) Such as ascribe a spermatick Force to the Testis. (5.) Such as will have it to be a Mixture and Temperature, taken from all the Facultys of the Soul. (6.) Such as plead that it falls from the Part of the Body into the lesser Veins, and out of them ascends into the greater, and swims like a Cloud upon the Humours; and is at last attracted by the force of the Testicles. (7.) Some derive it from all the Parts of the Body; others from the Mass of Blood only. (8.) Some wholly reject the last, and fetch it from a sweeter Juice, or some milky chylous Matter. (9.) Others say it's the Excrement or Residuum of the most elaborated and finely digested Juices, falling like a Dew from all the Parts of the Body, and meeting at the Spermaticks. (10.) Some will have it to be only a simple uncompounded nervous Juice, destitute of all other Mixtures.

These were the chief Opinions of the Hypothetical Gentlemen, and each of them had their Patrons and strenuous Defenders;

fenders ; who rack'd their Wits to invent Arguments to maintain their darling Notion : And many of their Arguments are fitter to move Laughter, or raise the Choler of the sober, than to satisfy his Curiosity, or inform his Judgment. Wherefore some who were dissatisfy'd with this supposititious or guesfive Way of arguing, with them next to experimental Examination ; the first whereof hath caused animal Seed to undergo the fiery trial of the Chymists Furnace, to make it discover its Principles, but found it consist only of the same with all the Parts of animal Bodies ; viz. An insipid Water, a fetid Oil, some volatile Salt, a Residium of much light Earth in the *Retort* ; but in *Rectification* it afforded no Spirit. See *Act. Erudit. Lips. Supplem. tom. 4. Sect. 10. p. 445.* And *Borellus, Obs. Med. Phys. cent. 3. Obs. 5. p. 237.* *Et chymicos qui sperma & sanguinem humanum coctione in pediculos mustasque converterunt, se fidisse refert.* And, *Gabr. Glauber. de Tinct. Universal. cap. 5. p. 134.* says, *Eo dementia pervenerunt nonnulli Chymistæ, ut pro conficiendo suo lapide Philosophico, materiam in spermate humano quærunt.* But still some Mens curiosity, not being satisfy'd with all these Guesfes and Experiments, they next try what they can discover in it,

by

by ocular Examination and Demonstration ; whereby they are convinc'd, that the Sperm is only a Croud of *Animalcula*, or small Worms, with long Tails, like Tadpoles, swimming in a viscid Serum. And they are so found of this notable Discovery, that *Leewenhoeck* and *Hartsecker* are like to go by the ears about it, each challenging this for his own Observation and Invention : But let them differ as they please, we know it belongs to neither of them, for *D. Ham* first of all observ'd these *Animalcula* in the Semen of a Cock. And long before any of them, *Ludovicus Bonaciolus* advises us, when we are solicitous to know whether a Woman be conceiv'd with Child, to take her Urine, and put it into a Glass Vessel, shut it up, and set it three days in the Shade ; then filter it thro' a Linen Cloth, and if you find therein little Worms like Lice, then he says she is certainly conceiv'd. Now one wou'd think that these were *Leewenhoeck's Animalcula*, or little perfect Men, come down from the *Uterus* to keep centry in the Neck of the Bladder, till they be wash'd off by the Urine, and chang'd into small Lice. A strange Metamorphosis indeed, Men become Lice ! But to ascend higher ; *Plutarch*, in his *Symposiaca*, *Lib. 8. Quest. 9.* discover'd and describ'd a Spermatick Worm, saying, *Hospitem nostrum novimus*

novimus Athenis Ephebum cum multo semine ejecisse Bestiolam asperam multis pedibus celeriter ambulantem. But neither is this Doctrine of Seminal *Animalcula* without its Opponents; for *Iddo Wolfius*, *Philip Verheyen*, *Christianus Vater*, *Johannes Langius*, *Andreas Ottonar*, *Gælickius*, and several others, flatly deny the Existence of any such Insects in the Genital Liquor, and say, that what is supposed to be these *Animalcula*, is only Flatus's of Air, intermix'd with the Sperm, which, seeking to unbend themselves, or make their escape, cause that Motion in the Seed.

At nostrum non est tantas componere lites.

But we shall allow the Masculine Semen (like most other Fluids) to abound with these little Insects, and shall attempt to give a rational Account how they come into it, and are bred in it, and why they are more conspicuous here than in most other Fluids of the Body.

It's the Opinion of some, that whilst we are young, and our Stomachs weak, the *Ova* of Insects taken in with our Food and Air may escape the Attenuation, Digestion, Communication and Attrition of the Stomach and Intestines, and lie there and generate Worms, which may
again

again depofite their *Ova* in the Guts, fome whereof may be fo fmall as to enter the Lacteal Veffels, together with the Chyle, and mix and circulate with the Blood, and be ftrain'd off by the fpermatick Veffels, fooner than any other Subftance, becaufe of their fmoothnefs and politenefs; and if they be fo fmall as to enter the fmall Pipes, they may be readily convey'd along all the Gyres, Turnings and Windings of the *Testes* and *Epididymides*, till they arrive at the different Veffels, and thence get into the feveral Bladders, whither there are daily arriving other new ones, till the Age of Puberty, or time of Seminal Difcharge: And that thus the Seminal Bladders, from a fuppos'd continual Addition of new *Ova*, may be fretch'd forth and extended, juft as the Inteftines of the *Fætus*, are full of *Meconium* before the Birth, and the Bladder full of Urine. Now when thefe *Ova* are got into the *Veficulæ Seminales*, where they are at reft, and lie till the Boy is of Age, and there generate, and become little Infefts, and fo cover the Surface of the Seed-Bladders, they fhall never be free of that Spawn, till we are capable of Generation; but when we are grown to Strength, our Stomachs and Inteftines are fo ftrong, that they attenuate, digeft, and grind down, not
only

only the Insects which we swallow, but the *Ova* also.

To all which may be answer'd, That it's improbable and impossible that these impregnated *Ova* should lie in the Seminal Bladders, from Infancy to Puberty, without coming to Life: And if they should become live Insects, and breed without any Evacuation of them for so many Years, what irreparable Mischief must they first make upon their containing Seminal Bladders, and then upon the circumjacent Parts, Intestines, Bladders, Peritoneum? &c. And none can deny this, who have read *Sennertus*, *Schenckius*, *Spigelius*, and others, who have seen and written on the Tragedys acted by Worms, how they have corroded the Stomachs and Intestines of Children, and even eaten their way thro' the Belly and Navel; yea, that they consumed all that fleshy Part on the Groins, and came to the Surface of the Body. Now if Vermin make such Dispatch, in a short time, upon thick and strong Intestines and Muscles; I do not see how the delicate Seminal Bladders can, for 15 or 16 Years, imprison such innumerable Numbers of *Animalcula*, generated and bred from such a heap of *Ova*, as from Infancy to Puberty are daily added to them from the *Testes* and different Vessels; besides

B

the

the prodigious *Myriads* which are still generated from the diurnal Generation of the formerly repositied *Ova* and Insects : for what may be done by a few Worms or Maggots in a short time, may certainly be expected from a vast Congeries of little Animals, in so many Years ; especially seeing there is both a daily Generation there, and a continual new Addition from the *Testes*. How quickly is Cheese consumed by Mites, Leaves of Trees by imperceptible Insects, Hair of Animals by the *Tinea* or small Mite, and solid Wood it self into Dust by minute Insects ?

But suppose it shou'd be answer'd, that the *Ova* arriving at the Seminal Bladders, are so very small, and the number so inconsiderable, that we need be under no Apprehension of Danger from them : yet this affords no Satisfaction when we consider,

First, That from Infancy there's suppos'd to be a continual Addition of new *Ova*, stretching forth and extending the Cavities of the Seminal Bladders, till the Boy be of Age.

Secondly, When we reflect on the sudden Generation of Insects every where, (for a *Chrysalis* in which a Worm had been wrapt up, will be full to day, and to morrow quite empty, and the Butterfly

fly got out of it, flying abroad in its full Stature and Magnitude) since this Generation is so sudden, and their Spawn so numerous ; this destroys their Argument, who say that these *Ova* may be laid up in the different Vessels and Seminal Bladders, till the Boy comes to the Age of Puberty. The Difficultys such Gentlemen leave us in the dark about, are as great as any they can remove : for,

First, Let us suppose that these *Ova* may lie in a Quies in the Seminal Bladders, till the Age of Puberty ; then what prevents the Generation of these repositied *Ova*, and impregnation of the *Animalcula* in the *Vesiculæ Seminales*, until the Boy be *Puber* ? Or what is there to impregnate, and render them fruitless after that time, which there was not before ? What hinders the Corruption and Putrefaction of these small *Ova*, lying so many Years in a warm moist Place, which is fit either for Generation or Corruption ? But,

Secondly, If they did generate, (as it's most probable they would, if they were there) how could these strait Bladders be capable to contain such a vast Croud, as a diurnal Generation in that place, and a daily new Supply from the Testicles, must amount to. 'Tis surprizing that any

should pretend that these *Ova* should be strain'd off only by the *ductus spermatici*, when we are assur'd from Experience, that they are strain'd off and generated in all Parts of the Body, both internally and externally. And according to these Gentlemen's Hypothesis, when the *Ova* are got into the Seed-Bladders, seeing they are for several Years shut up in these Cells, we might expect them to produce Maggots, were they capable of such Growth and Bulk. And as a Consequence of this, the first ejected *Semen* would be chiefly a Heap of Worms or Insects, instead of small (and imperceptible by the naked Eye) *Animalcula*: And according to this Opinion, more Sperm should be ejected the first Year after Puberty, than in several Years after, and that Sperm should be better elaborated and fuller of *Animalcula*; and, supposing these *Animalcula* so many Embrios of human *Fætus*'s, should be more productive of strong, healthy and lively Children: all which is contradicted by daily Experience.

Lastly, Seeing these Insects are so short liv'd, then if they generated in the *Vesiculæ Seminales* so many Years, the greatest number must be dead, putrify'd and rotten in that time. And one would think it very improbable for the rest to live in
such

such a Kennel of Filthiness, especially to feed upon the putrify'd Carrion of their own Species, which certainly must make up a considerable part of their repast.

Secondly, I shall give the Reasons which seem to me more probable, why Children have not *Animalcula* repositied from *Ova* in their Seminal Bladders (supposing these *Ova* to come from without and swallow'd down, together with our Air and Food) altho we had an Opportunity to examine with a Microscope, that thin, useless, insipid Mucilage, contain'd in the Testicles, *Epididymides*, different Vessels, and Seminal Bladders ; because,

First, During Infancy the straining Vessels or Glands of the Testicles are too narrow and small for the *Ova* to pass ; which is further prov'd from such Observations as shew that the *Ova* being mix'd with the Blood, when that comes to pass the capillary Vessels, the Diameter of the Egg being larger than the Cavity of the Vessel, it must stop there, and be wedg'd in by the Force of the Fluids behind ; is hatch'd by the Body's Heat, and produces a Worm or Worms, if other *Ova* arrive at it, and stop also : And this Case we know has often happen'd in most parts of the Body. Thus Worms have been bred and found in the Liver, Kidneys, Bladder, Blood-Vessels, Brain, Eyes,

Eyes, Teeth, Ears, Nostrils, Feet, Navel, Heart, Lungs, Spleen, &c. Sometimes where Ulcers or Abscesses have seated themselves in any external Parts of the Body, there have been found Worms in them : Of these *Herod*, *Sylla*, and *Alcman*, were eaten up, and are called by *Cælius Aurelianus*, *pediculi ferales*. I shall not here treat of the fundry Kinds of Insects found in the Intestines ; *Andre* and *Le Clerc* have written well on this Subject ; but especially the learned *Valisnerius*, who hath carefully dissected several of them, and hath oblig'd the World with a curious Anatomy of them. And tho Worms have bred in most other Parts of the Body, yet we have scarce any Instances, where they have been observ'd to generate in, or be discharg'd from the Substance of Childrens *Testes*. Wherefore I am ready to think that these secretory Ducts, which strain off the *Semen* from the Blood, are very narrow, and therefore the Eggs cannot enter nor pass them, but are, together with the Blood, returned back to the spermatick Veins. This Opinion appears more satisfactory, because the Sperm seems to consist of more elaborated Particles, than the matter of other Evacuations ; for its more ponderous Subsidy in Water is of a thicker Consistence, and condenses still more in Spirit
of

of Wine ; but if it be laid on a dry Place, exposed to the Air, it presently becomes fluid, transparent, and loses its Viscidity. The Production of Worms in the miliary Glands, on the Surface of the Body, is no good Argument against this : for,

First, When the *Ova* get out of their road, into the Labyrinths of the miliary Glands, they cause an Obstruction and Tumour ; they breed there, break the small Vessels, and get thro' the Skin.

Secondly, Worms are sometimes produc'd on the Surface of the Body, (where the Skin is excoriated) from the *Ova* floating in the Air, falling upon the grieved Place, and taking up their Abode there, and generating others.

Thirdly, It's not improbable that the *Ova* of these *Animalcula* of the Masculine *Semen*, are greater than the *Ova* of some larger Insects ; and then it's no wonder that they neither pass the miliary Glands, nor the spermatick Labyrinths of Children.

That some particular Glands have such narrow secretory Ducts, as will not allow the *Ova* to pass readily, is manifest,

First, From the ropy Matter discharg'd from the *Penis*, upon intense amorous Thoughts, or lascivious Conversation, which

which tho more tenacious then the *Semen*, and strain'd off by the Glands of the *Urethra*, yet we do not hear of any *Animalcula* taken notice of in it.

Secondly, *Leeuwenhoeck* owns, that *Mens Semen* has no *Animalcula*, and this he assigns for a reason of Sterility ; but hereof he gives us but one Instance, and for any thing we know, the fault even of this might be from some indisposition in the *Ova fœminæa*, *Tubæ fallopianæ*, *Uterus*, or some of the circumjacent Parts; or the Male Sperm might want that Vivacity, Subtility, or forcible Projection : but however these were, yet we may safely impute his want of *Animalcula* to the narrowness of the *Meanders* of the *Testes*.

Thirdly, The Flaccidity and Emptiness of the different Vessels and Seminal Bladders before Puberty, and the minute Portion of *Semen*, discharg'd by Boys for some Months after the first Seminal Evacuations ; yea such is the Penury of it, that we have Historys of some wicked Boys, who desiring to anticipate Nature, and gratify their too early libidinous Desires, have ejected Blood instead of Sperm.

Fourthly, Not only the small quantity, but the tenuity and aqueousness of their genital Liquor, shows the narrowness of their spermatick Strainers.

Fifthly,

Fifthly, In old Age, when the Tubes contract the Canals are straitned, and few or no *Ova* pass; there's but little *Semen* separated from the Blood, and what is strained off is mostly useless, either for Generation or Stimulation to Venery.

Lastly, The Spittle has likewise pass'd the Microscopial Examination; but *Leeuwenhoeck* could observe no *Animalcula* in it, and we are sure that that Secretion has a much shorter way to pass, after its Separation from the Blood, till it come into the Mouth; so that if the narrowness of the Glands hinder'd not the Passage of the *Ova* from the Blood, we should rather expect them here, than in the *Semen*.

Hitherto I have spoken of the Visibility of the *Animalcula* in all Male *Semen*: But now let us try how we can account for such vast Multitudes of Insects in this Liquor.

The first reason then, why I suppose we meet with greater Numbers in this Liquor than in several other Secretions of the Body, is the slow Circulation of the Blood in the Spermatick Vessels, whereby the seminal Particles have time to approach and attract one another: For the Course of the Blood in the spermatick Arterys, betwixt the great Artery and the *Testes*, Dr. *Keil* has demon-

C

strated

strated to be 150 times slower than the Motion of the same Blood would be in the great Artery, or even in the *Iliacks*. And if its Motion decrease so quickly in the first Division from the *Aorta*; how much more languid then must its Motion be in the many Divisions, Subdivisions, Turnings and Circumvolutions of the testicular Glands! No inward Secretion or Circulation is so slow in the whole Body, it being little more than what seems necessary to prevent the Blood's stagnation.

Secondly, The long Retention of the *Semen* in the different Vessels and Seminal Bladders, which is more obstinate than any one, or all of the Abdominal Secretions. To this I add,

Thirdly, The speedy and surprizing Generation of Insects, the Breeding, quick Growth, numerous Progeny, and short Life, of the Butterfly and Silk-worm, Flesh-fly, and Fly-Maggots, may be seen at large in *Leewenhoeck's* Observations. Now if these are bred and come to Maturity in so very few Hours, how much sooner the *Ova* of the *Animalcula*, which are much less, and may therefore be suppos'd of much shorter continuance? I might also instance, in the surprizing, speedy, and prodigious Progeny of the small Worms called *Astarides*, great Numbers whereof I have known bred afresh every

every Night, and evacuated next Morning at Stool : Let us then suppose the Generation of the Seminal *Animalcula* to be as speedy ; if the *Ova* should pass the Glands, and get into the Seminal Bladders during Childhood, what *Vesiculæ Seminales* would be capable to contain the great Fry of small Worms, bred in the space of 15 or 16 Years ?

Fourthly, The Sperm is seemingly the most homogeneous Secretion of the whole Body, and the most agreeable for the Generation of these *Animalcula*, being it self, not only a prolifick, but a smooth balsamick Fluid, seemingly endu'd with all Propertys which can conduce to render a Liquor either fertile or nutritious. If we consider these things, we shall see Reason to be of that ingenious Gentleman's Opinion, mention'd by Dr. *Blair*, who thinks that these *Animalcula* are the same with those we see in Water, but under different Shapes.

But let us next enquire for the Causes why these small Insects are either not so numerous or perceptible in the Blood, Bile, Urine, or pancreatick Juice. And,

First, None of these seem of so agreeable a Nature, have neither so much rest, nor afford so proper Nutrition.

Secondly, Because, as Dr. *Blair* says, the Blood being a Compositum of all the

various Particles of the whole Fluids in the Body ; it appears, under a more solid form in Globules, where the several Particles are compactly and firmly united, so that the *Ova* or *Animalcula* are not so perceptible, unless the Particles were separated into their different Parts ; and even this Heterogene Mixture call'd Blood has sometimes had Worms in it.

Thirdly, These *Animalcula* seem to meet with the cruellest Treatment in the Bile ; for altho several Physicians and Naturalists have observ'd abundance of live Worms in the Liver, yet rarely have they been found alive in the Bile or Gall-Bladder : for this is the most purgent, sharp and bitter of all the Secretions, and is chiefly made up of very sharp Particles like small Wedges ; whereby, when by the peristaltick Motion of the Guts it's mix'd with the Food and Fluids, it breaks their acrid saline Particles, as well as divides the coagulated, or mixes the watry and oily : The pungent bilious Particles are darted into either the Bodies or *Ova* of Insects, that are larger than the bilious Particles in the Intestines, and kills them if alive, or prevents their Generation if they be only in *Ova* : But the *Ova* or *Animalcula* swallow'd with our Meat or Drink, being both so numerous and small, get out of the *Duode-*

num unhurt ; but if the Bile be pure and unmix'd, very few Species of Insects can live in it.

Another Reason why many *Ova* and Insects may get out of the Intestines un-touch'd by the Bile, is, either its scarcity in the Body, from the secretory Ducts of the Liver being stuffed with a gritty Matter, causing a Jaundice ; or its meeting with obtundent and tenacious Meat, Drink, or Medicine, often pour'd down into the Stomach. And, lastly, The *Animalcula* are not so conspicuous in the Bile, because it's of a darker Body than the *Semen*.

Fourthly, The Pancreatick Juice is constantly flowing into the *Duodenum*, as it's separated from the Blood, and so the *Ova* have but a short Residence there to generate Insects. And suppose they were in it, its immediate Mixture with the Bile, would render it very disagreeable to live Insects. This Mixture of the two Juices prevents our Discovery of *Animalcula* ; or perhaps the Texture of the procreatick Glands may not be so convenient for their Conveyance.

Fifthly, The Urine being often full of pungent Salts, they would be darted into the delicate Bodies of these little Creatures ; therefore are we not to expect them so frequently and plentifully
in

in that Liquor, it not being of so amicable a Nature for such Guests : And also several times have there been Worms voided with the Urine ; yet do I not find that either *Leeuwenhoeck* or his Votarys, have met with what they call Seminal *Animalcula* in it : for which reason it would appear that the Urine is no beloved Habitation of theirs.

Sixthly, The Serum of the Blood is not altogether so fit a Vehicle, for they having some small Solidity, must be deposited in the Sediment, together with the Blood Globules, and so become invisible.

Seventhly, Neither could *Leeuwenhoeck* find them in the *Saliva* ; for the Glands which strain it off from the Blood, seem to have too narrow Ducts to suffer the Passage of either Insects or their Eggs. The disagreeableness of both Bile and Urine to these little Animals, is further evident from this, that altho the strainers of both Liver and Kidneys seem larger and laxer than the testicular Strainers, and might therefore be suppos'd to admit of these Insects, yet are they rarely perceiv'd alive in these Liquors.

I shall now try to account for several ways how these Insects are generated in the *Semen*, and come to be reposed in the *Vesiculæ Seminales*, when
Boys

Boys come to Puberty : And this will serve to illustrate, not only the Generation of these, but of all other Insects which are to be met with in human Bodies. These ways I suppose to be chiefly three, *viz.* 1st, From our Creation. 2^{ly}, From our Propagation. 3^{ly}, From our Sustentation.

It's from the first two of these that we can account for Worms in the Bodies of Embrios, *Fætus*'s, and Abortives : But the Generation of Insects from our Creation, I presume to be this, That altho God, at Man's first Creation, did not directly and purposely sow the Seeds of such an ineradicable Vermin in human Bodies ; yet Man's Body being made of Earth (whether Clay, Dust or Ashes, it's not material to our Design) towards the Evening of the sixth Day, when he had ended all his other Works ; the Earth not only then abounded with Insects and *Ova*, but having been at first created and furnish'd with the Seeds of all these, there must fall some of the minuter of them to the share of that part of Matter, which went to the *Compositum* of the human Machine. And these might not only be a Seed for the Generation and Propagation of these Insects in the first Man's Body, but serve for the Seeds of a lasting Progeny in all his Posterity, who shall descend

descend from him. 'Tis surprizing to see how little trouble the Antients gave themselves in inquiring into the Cause of Vermin in animal Bodies ; they were satisfy'd that they had solv'd the doubt at once, by saying, that Insects were form'd from themselves, out of a certain putrid matter, by Heat and Motion : But they never regarded the Destruction of their Hypothesis, when they might observe that the Generation of Insects, and all other Creatures, was always alike the same ; for if slimy and putrid Matter could give Form and Life to any Creature, it were ridiculous to expect that the Species should still be of the Sort, and always keep one Form and Shape. According to their Notion, where there is plenty of Slime and an agreeable Warmth, Men might with Horror and Danger look on, and see strange and prodigious Monsters daily arise out of this Heap of Putrification, ready to devour the Beholders, and the Food design'd for their Provision. *Mercurialis*, either perswaded of the Folly of this Supposition, or affecting to be singular, fled to occult Qualities, and celestial Powers, which by the Mediation of proximate Causes, form'd Animals : But he could not dispute, whether this was the *Facultas fortuita Galeni*, or the powerful *Factor calcodea Avicennæ*, or
Plato's

Plato's Anima Mundi : In the last Age the indefatigable *Redi* has demonstrated, that the Generation of Animals and Insects is still alike ; and then all Philosophers with unanimous consent, banish'd the Notion of equivocal Generation, and assign'd Insects the same Parents, *viz.* *Ova* : Of late appear'd the learned *Valisnerius*, who strenuously contends that Worms in the human Body are coeval with *Adam*, and says that the Eggs of all Insects that generate in Men, were purposely created by God in the Body of the first Man, even when created in a State of Purity and Innocency. One great Difficulty which put him on coining this new Scheme, was to account from whence these Eggs came, and how they can be detain'd in human Bodies ; for he thinks it equally dangerous to true Philosophy, whether we believe that Animals are bred out of Corruption, or suppose a certain kind of Animals produc'd from the Eggs of others of a different Kind, and so confound their Species. Thus, says he, we give to some Insects feign'd Fathers, and to others bastard Children : What he chiefly builds his Argument upon, is, That we can find no Species of Insects without us, to which we may fitly compare these Insects bred within us ; and then to establish his Opinion be-

yond all Controversy, he says, That the Insects without us, as they are of different Kinds, so they have their fundry Habitations: Such as live in one kind of Earth will die in another; and on Shrubs and Trees, these who live on its Roots would pine on its Leaves; and those who feed well on the Bark, would starve on the Wood, Fruit, Leaves, &c. Tho it be not my Design to examine all this learned Man's Arguments, yet give me leave briefly to observe, *en passant*, that as we meet with variety of Insects without us, so are there different Kinds of Worms within us.

Secondly, We know that either Vegetables or Animals, remov'd from their natural Soil to a very different Climate, and Nourishment, will in a few of their Generations be so much changed from their natural Appearances, that they will hardly be taken for the same; this is so commonly allow'd, that it needs no Proof.

Thirdly, The many Historys and Observations of the Spawn of Frogs, Beetles, and other Insects, having been unwarily swallow'd down with Meat or Drink, and generated in the Body, leaves no room to doubt but that the *Ova* of Insects swallow'd down will breed in us, and produce a Vermin which will live in us, tho depriv'd of the open Air, and the

the common Food of its Species, such as that we meet with in the *Philosophical Transactions* of a Man's Girl at *Sheffield*, aged only three Months, who after swallowing greedily a Pint of Wormwood Ale, she vomited up three *Hexapodes*, all very active and nimble; these, *Dr. Lister* says, would have chang'd to Beetles: And also the Man's Son, who after a long and grievous Pain of the Stomach, vomited up several strange Worms, in the ninth Year of his Age; these Worms, says *Dr. Lister*, were Caterpillars with 14 Legs, for he had many times seen of the same Kind on Plants; and no doubt (says he) these would in due time (if the Place had not hindred) have shrunk into *Chrysalis*'s, and chang'd into Moths.

Fourthly, There may be some unheeded Circumstances in the Generation and Production of several Insects, that will not only come up to, but exceed the Dissimilitude of these Insects bred in in our Bodys, to these of the same Kind without us. I shall instance in some that we know, *E. gr.* Who wou'd believe that that fine flying Insect the *Lybella* should be generated like a Tadpole under Water, wrapt up in a Membrane till she be near ready to leave that Element, and appear in a more glorious Dress in the open Air?

Who would expect that great Caterpillars should sometimes produce two or three, or a whole Swarm of *Ichneumones*, an Insect with four Wings, *Antennæ*, like a Bee? &c. Dr. *Lister*, *Apr.* 2. 1671. dissected some black Beetles which were cast up in his Garden, and found live hair Worms in their Bellies, which crept out and crawl'd, when the Beetle's Belly was cut up; they were some Inches long, and about the thickness of a Hog's Bristle. These are what have been taken by the Vulgar for Horse-hairs turning into Eels, or animated Bodys in Water. Strange it is also that the wild Bees which breed in old Willows, if these Bees, Maggots or Nymphæ happen to miscarry, they breed, 1st, little *Hexapodes*, which produce Beetles: 2^{ly}, Maggots, which produce Flies: 3^{ly}, Mites, &c. And what more wonderful Metamorphosis can we imagine than that of a Caterpillar into a Butterfly, and of a Butterfly into a Caterpillar again? We have also sufficient Experience that several Insects live casually and promiscuously on Herbs, Leaves, Flowers, and Fruits.

Fifthly, Insects from *Ova* taken into our Bodys, may generate and live there, having, during their Generation, been nourish'd with the Juices of our Bodys, and afterwards fed with the same. And indeed it's more reasonable to think that the

Insects

Insects of our Bodys are bred from *Ova*, than from Vermin swallow'd down alive ; for I have known some consumptive Persons swallow many small Frogs alive, without any Generation thereof, or inconvenience therefrom. But a young Fellow in the Neighbourhood where I liv'd, had not so good Fate ; for he in the latter end of *February*, carelessly drank some Water, wherein was Frog-spawn, and had therefrom generated in his Body a fine fry of young Frogs, whereby he was emaciated and reduced to a living Ghost ; and when neither the greatest Bitters nor strong Purges could be of any service to him, there were given him strong Vomits of white Hellebore, which raised such violent Spasms and Convulsions in the muscular Fibres of his Stomach and Intestines, that the nauseous destructive Vermin were forc'd to quit their hold and be thrown up. So there's no doubt but several Insects which are swallow'd alive by us, will live and breed : and for this reason it is that wise Nature has taught Herons and some other Fowls, which live much on Worms and Insects, to draw them often thro' their Bills, and pinch them till they are dead before they swallow them. Another great Difficulty with *Valisnerius*, is, That there have been many kinds of Insects found in hu-

man

man Bodys, none of whose Species were ever seen abroad in the World. But to this may be reply'd, 1. That the different Soil may very much alter the Creature from those of the same kind without us. 2. Some Creatures have very different Appearances, according to the fundry Stages of their Growth : thus Bees are first white Maggots, then Bees ; Frogs are first Tadpoles and swim like small Fish in the Water ; *Ichneumones* are first a kind of Tadpole, then a glorious flying Insect, &c. I confess that sometimes such Observers may be willing to flatter themselves, and think they have seen Monsters, and so impose upon our Faith, when perhaps their great wonder may be only a little coagulated Blood, unnatural Excrescence or *Polypus* appearing, or cunningly represented by the dextrous Operator in such a Shape ; for there is no such thing as a new Creation of Animals or Insects of such an unknown Species ; such things are proper only to amuse Idiots, Half-wits and Children, who can be prevail'd upon to believe a spontaneous Generation in opposition to God, Reason and Observation. These are the chief of *Valisnerius's* Difficultys, which drive him back to Man's first Creation for the Origin of Insects in human Bodys ; but we
see

see there's no such Difficulty in them, as to challenge our Compliance with him.

Secondly, Another way how Insects are generated in human Bodys, is, from the Seed it self: for consider we that the *Semen* whereby Man is propagated, is said to abound with live Insects; and can we imagine that Creatures of such vigorous, agile and minute Bodys, cannot penetrate and make their way thro' the interstices of the dilated Membranes of the *Ovum Fæminæum*, get into the Rudiments of the *Embrio*, be shut up in its Vessels, and be mix'd with its Fluids, circulate with the Blood and Juices, live, lay their Eggs, and breed in the Body of the *Fætus*? The *Animalcula* make up the subtilest Part of the Masculine *Semen*; and it would be ridiculous to assert, that the sluggish viscid Part made its way into the *Ovum*, but the more subtile and active Part did not: Therefore the Repletion of the Seed with these, is sufficient Foundation for future Generation, and a lasting Progeny of the kind in every Man and Woman during Life. Now to assert the Destruction of them in the Womb, were absurd, seeing the *Embrio* is nourish'd with the finest Juices of the Mother's Body, which must make as agreeable a repast for them, as they can meet with afterwards in the Bodys of Adults.

Thirdly,

Thirdly, The last way how I suppose the Insects in animal Bodys do come, is, from our Sustentation or Food ; and this I divide again into three, *viz.* That wherewith we are nourish'd in the Womb. 2. That wherewith we are fed in our Infancy, to wit, the Mother's Milk : and, 3. That which preserves human Life ever after.

As to the first of these : Let us remember that the *Embrio* in the *Uterus* is not only surrounded with, but fed by the Mother's Juices, especially those in the *Amnios*, in which are discover'd multitudes of *Animalcula* of several sorts : And these, together with the Fluid wherein they live and sport, getting into the Body and Vessels of the *Fætus*, will leave the Seeds of a Vermin, which shall never be extirpated. And from this may Insects of sundry kinds be found in the Bodys of Abortives. Now that the Child receives some of its Nourishment from the Liquor contain'd in the *Amnios*, the learned and curious *Heister*, Professor of Anatomy at *Altorf*, has fully prov'd. But suppose the Child had no part of its Nourishment from these Juices, yet is there, not a constant Circulation of Fluids from Mother to Child, and back from the Child to the Mother again ? And are there not multitudes of Insects and *Ova* in the human Blood,

Blood, tho its globular Parts render them invisible to us ? But,

Secondly, Suppose the Child should come into the World, free from all manner of Insects or *Ova* (which yet is neither probable nor possible) after its Birth, is not much of its Food Milk ? and are we not satisfy'd that the Mother's Milk abounds with *Animalcula* ? and is not here sufficient Cause for the Generation of all these Myriads in the human Body, whilst as yet an Infant ? How are we to expect that the Infant's Body should be capable to destroy all that Vermin, since they escap'd the strong Attrition of the Mother's Stomach, Lungs, and Muscles, all which are stronger in the Mother, than it's reasonable to expect in the Infant ?

The last Cause I assign'd for the Ingestion and Generation of Insects and *Ova* into our Bodys, was by those Means which are the Preservation and Support of human Life, during the remaining Course of our time ; and these are our Meat, Drink and Air : I say, from the Mixture of the *Ova* of Insects with these. For altho it be suppos'd that when we are Adult, our Stomachs are able to attenuate and digest, not only the ingested Aliments, but also many of these *Ova*, which

E

must

must undergo the common Fate of Attrition and Comminution of their Particles; but in Youth, especially in Childhood, the Stomach is weak, and the *Ova* escape, and generate Insects in our Bodys. To this Cause may be added Children's irregular way of eating, often cramming down new Food, before the former was fully digested, and got out of the Stomach, whereby their *Chyle* must be coarse and unprepar'd: a Viscidity will subside and line the inside of the Guts, and become a fit Nest for the *Ova* to take up their Residence in, and become a Filter to the *Chyle*, whereby the *Ova* of larger Insects are detain'd, hatch'd, come to Life, generate, and become the Parents of an innumerable Progeny. Childrens incapacity for Exercise contributes its share to this; for their Solids are weak and lax, and then their Food is not only such as abounds with *Ova*, but as the Parents of these *Ova* have found it a proper Receptacle for them, so their Offspring must find it exceedingly agreeable, *viz.* Milk, and the farinaceous Foods. I could assign other Causes, but these are sufficient. However, I deny that when we are Adult, our Stomachs are so very capable of attenuating, breaking, and digesting the Particles of the *Ova*; for that is more
pro-

properly the Use of the Lungs, and the Effect of muscular Motion, to divide and grind down such *Moleculæ*, or small Bodys. But when all these have exerted their utmost Force, still great Numbers of both *Ova* and *Animalcula* escape all their Shocks ; as is evident, 1st, From the Generation of Worms and Insects in all parts of adult Bodys : 2^{ly}. The Production of such Myriads of *Insects* in dead Bodys in few Days, as quickly eat it up, especially if the Season be very warm. Now that all these are *Ova* swimming in the Air, and falling upon, and breeding in dead Carcases, I deny : for altho these Insects may seize upon it externally, yet far greater Numbers are produc'd from *Ova* and Insects within the Carrion it self. This I am satisfy'd of from these Observations. 1st, I have found incredible Numbers of these little Animals, generated and living in the fleshy Parts of dead Bodys, where both Skin and Scarf Skin have been found and intire : this I have seen, especially in dead Fish, upon the Shore in Summer-time. 2^{ly}, Take a dead Body in a hot Summer Season, and cover it up from the Air, and you shall find that this will not wholly prevent the Growth of Insects, only it will be longer before they breed, and arrive at their Perfection ; and

no doubt fewer in Number, from the Deprivation of adventitious *Ova* and *Animalcula* from the Air. 3^{ly}, The Consumption of human Bodys in the Grave, is a plain Proof of this ; for let the Coffin be contriv'd never so close, or the Grave deep, yet great Numbers of Vermin generate in the Body : Here the deep Interment prevents the Accession or Addition of *Ova* from the Air, and the closeness of the Coffin hinders their getting in from the Earth ; for I found in a Skull newly digg'd up out of a deep Grave (which had not been many Years shut up) a great Multitude of small Worms of different kinds, tho the Coffin was close and sound, till broken by the Sexton. I had lately under my care a Woman who voided, every Day by Stool, a Multitude of *Ascarides* ; she was then past 40 Years of Age, and had been accusom'd to this Evacuation every Morning for several Years past. I was acquainted with a Gentleman, who discharg'd every Morning at Stool many large Knots of them clean before the Excrements, and yet both enjoy'd a good State of Health, had a good Appetite and Digestion : The first I recover'd by prescribing a tedious Course of Bitters, with daily Exercise ; and the last by the Chalybeat Waters. I hope it cannot

cannot be deny'd, that Dogs have as strong a Digestion as most Animals, and yet they are never free from these Insects. This I think is sufficient to invalidate the Strength of their Arguments, who affirm that the Force of adult Stomachs hinders the Generation of Worms, by breaking and grinding down their Eggs.

But now it remains in the last place, That I show how I suppose these *Animalcula* to come at the Seminal Bladders of Youth, when come to Puberty; and that is, (supposing them to come from without) the Number of Vessels in Infants or *Embrios* is much greater than in Adults: as Children advance in Years, tho the greater Vessels lengthen out and grow, yet the least become more compact, their Diameters shorten, the quantity of Fluids admitted is still less, till at last they refuse all Access to the Fluids, then close up, grow together, and are changed into minute Fibres, which requiring less Space, give more Liberty to the larger Vessels to expand themselves; their Compression being lessen'd, their Canals are enlarg'd, they allow more and larger Particles of Fluids to enter their Orifices, and move along their Tubes; the Membranes of the Vessels being yet dilatable, and the contain'd Liquor pressing *Undiquaque*, the
Diameters

Diameters of the Vessels are lengthen'd, and their Orifices and Cavities are proportionably widened, and are capable to admit Particles of larger Diameters than they could formerly receive ; amongst which, not only *Ova*, but minute Insects get along. And this appears to be truly the Case of the testicular Strainers ; for during Infancy, the natural Narrowness of these Pipes, and that increas'd by innumerable small open Vessels, (which afterwards vanish into solid Fibres) render the Tubes so exceedingly small, that only so much insipid Humour and Nourishment is suffer'd to enter, as suffices to keep open their Cavity, and nourish their Parts. But when both their Cavity naturally increas'd, and the small Vessels which wedge them in on every side have lost their Cavity, then not only a greater Quantity of Liquor will pass them, but Fluids consisting of larger Particles and *Ova* together with them. 2^{ly}, We shall add hereto the different sorts of *Animalcula* found in Water ; Dr. *Hook* says, that from his Microscopial Observations, eight Millions two Hundred and eighty Thousand of living Creatures may be seen in one Drop of Water. And as these had been too few, when he had procured finer Glasses, they not only magnified these he had formerly discover'd

to

to a very great Magnitude, but observ'd others much less than what he had formerly seen, and some of them so minute, that Millions of Millions of them might be contain'd in one Drop of Water. Now if we consider the State of the Testicles of Youth arriv'd at Puberty, I see no Difficulty why we may not allow the *Ova* of these little Animals to pass, and even the generated *Animalcula* themselves may make way, and be driven thro' all the Turnings and Windings of the Testicles, till they come at the deferent Vessels, and Seminal Bladders. How improbable is it to expect that the Stomach should exert any considerable Force upon the *Ova* of such Insects? 3^{ly}, Another Presumption that the Cavity of the Testicular Glands is the Occasion of the Admission of these Guests, is, because the mammillary Glands of the Breasts, which separate the Milk from the Blood, give ready Passage to prodigious Numbers of these Insects or their *Ova*, which may readily be discover'd by the help but of ordinary Glasses. Thus I have explain'd the Manner of the Generation of Insects in human Bodys; it now remains that I should treat of the use of these Seminal Worms, and enquire whether they are reasonably to be reputed the Rudiments of a human *Fœtus*, or
whether

whether each of them be an entire and perfect Man, as *Leewenboeck* and his Followers teach and believe. But this would protract the present Discourse far beyond its design'd Bounds : wherefore I shall defer this Inquiry to another Opportunity.

ERRATA.

PAGE 5. l. 8, 9. r. *guessing way of arguing, proceeded next.* Ib. l. 24. for *fidiſſe* r. *vidiſſe*. P. 7. l. 28. r. *Communion.* P. 8. l. 12. and p. 9. l. ult. and p. 11. l. 6. and p. 13. l. 14. for *different* r. *deferent.* P. 11. l. 19. r. *fruitful.* P. 12. l. 23. r. *they ſhould.* P. 14. l. 30, 31. r. *it's more ponderous, ſubſides in Water, &c.* P. 18. l. pen. r. *Aſcarides.* P. 20. l. 16. r. *pungent.* P. 22. l. 29. r. *the.*

BOOKS printed for J. ROBERTS in *Warwick-Lane.*

Human Nature vindicated; or, A Reply to Mr. *Beaven's* Book in vindication of the fourth Proposition of *Barclay's* Apology.

A Supplement to the Vindication of God's Moral Character: Theſe Two by Mr. *Chubb.*

A Discourse concerning the Nature, Causes and Effects of Corpulency; together with its Prevention and Cure. By *Tho Short, M. D.*



